SUBSTITUTE SPECIFICATION

HEIGHT ADJUSTABLE HEADREST FOR A VEHICLE SEAT

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

0001 This Application claims priority to PCT/EP 2005/00848, filed 1/28/2005 and published October 20, 2005 and to Germany Application 10200401379.2, filed 3/19/2004 including the specification, drawings, claims and abstract of each, which are incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

0002 The invention relates to a device for fixing a component, in particular a headrest in a vehicle, the component being assigned at least one fixing bar being displaceable relative to the device in a first direction running essentially parallel to its longitudinal extent.

SUMMARY OF THE INVENTION

0003 Devices of this type are generally known. There are namely guide devices or fixing devices of headrests in motor vehicles. Fixing or guide devices of this type serve to guide and to lock the two guide bars which protrude from a customary headrest, order to adjust the height of the headrest. It is known that during the production of any components, in particular for motor vehicles, dimensional tolerances or arrangement tolerances of the various individual parts of the components occur. In the example of a headrest as a component for a vehicle, it may happen that the fixing bars are, to a small extent, not arranged parallel or else are arranged at too great or too small a spacing. Tolerances of this type then lead to a height adjustment of a headrest of this type requiring too much effort. This has an overall adverse effect on the use of the headrest. It is also the case, however, that the fixing bars of headrests of this type must not be held in the fixing devices or in the guide devices with too great an amount of play (i.e., too loosely) because, firstly, they could start to rattle, for

example during vibrations of the vehicle, or could generally start to move in an undesirable manner and, secondly, such mobility leads undesirably to anesthetic impairment because the sense of value of a motor vehicle component of this type is thereby reduced.

0004 One embodiment of the invention relates to a device for fixing a component, in particular a headrest for use in or on a vehicle, which, firstly, can be adjusted in height comparatively easily or in general can be adjusted along the fixing bars of the component and, secondly, permits a sufficiently stable fixing of the component.

0005 One embodiment of the invention relates to a device for fixing a component, in particular a headrest for use in or on a vehicle, the component including at least one fixing bar, the fixing bar being displaceable relative to the device in a first direction running essentially parallel to its longitudinal extent, the fixing device having a tolerance compensation member which is in contact with the fixing bar, and the tolerance compensation member being displaceable in relation to the fixing device in a second direction aligned essentially perpendicular to the first direction. Accordingly, it is advantageously possible both to ensure easy displaceability of the component (Headrest) along the manually operated fixing bars and also to ensure sufficiently secure fixing of the component, in particular in relation to vibrational movements ("rattling").

0006 Furthermore, in one embodiment, it is preferred that the tolerance compensation members is also in contact with the fixing bar during a displacement of the fixing bar relative to the fixing device in the first direction. Contact during movement ensures that sufficient support and, in particular, sufficient protection against vibration is provided in any use situation.

0007 Furthermore, in one embodiment, it is preferred that a movement of the tolerance compensation member or means in the second direction is possible counter to a frictional force of the fixing device in relation to the tolerance compensation member. By this tolerance compensation member, it is advantageously possible to combine the two objectives of, on the one hand, the device being fixed in an as stable and secure manner as possible and, on the other hand, of the device being easily displaceable along the fixing bars, by the fact that the tolerance compensation

member is possible with regard to compensating for tolerances of the component or of the fixing bars of the component in a plane perpendicular to the first direction, but that the tolerance compensation member is arranged and is connected to the fixing device in such a manner that, in relation to accidental movements or vibrational movements of the fixing bar or of the component, the tolerance compensation member overall has an effect in obstructing or preventing this movement.

0008 In one embodiment of the present invention, it is furthermore preferred that the tolerance compensation member is in contact with the fixing bar at at least three points in a plane perpendicular to the first direction. This advantageously ensures good fixing and good securing of the component or of the fixing bar of the component in the device against all vibrational movements and the like which occur.

0009 In one aspect, the tolerance compensation member completely surrounds the fixing bar in a plane perpendicular to the first direction. The tolerance compensation member can be produced in a simple manner as a disk-like device. In the interior, the tolerance compensation member can preferably have a shape matched to the cross section of the fixing bar and, on the exterior, the tolerance compensation member can assume a shape matched to the cross section of the device or to the device receiving location, to which the tolerance compensation member is fastened.

0010 In another aspect, the tolerance compensation member is elastically deformable in the first direction by means of the device and by means of a compressive force. In this manner, a frictional force of the device in relation to the tolerance compensation member can be realized in a simple and cost-effective manner.

0011 In another aspect, the tolerance compensation member comprises a material having a low coefficient of friction, in particular in the region of contact between the tolerance compensation member and the fixing bar. This furthermore reduces the forces required for adjusting the component along the longitudinal extent of the fixing bars.

0012 In one particular aspect, the device is a headrest guide or sleeve device and/or component that has two fixing bars. It is thereby possible to better impose guidance or

a movement three-dimensionally when adjusting the component along the longitudinal extent of the fixing bars, i.e. an adjustment in the first direction.

BRIEF DESCRIPTION OF THE DRAWINGS

0013 Figure 1 is a partial cut-away of a guide device as disclosed;

0014 Figure 2 is a perspective view of a fixing device of the guide device of Figure 1;

0015 Figure 3 is a cross-section view of the guide device of Figure 1; and

0016 Figure 4 is a component, in particular a headrest attached to a vehicle seat back, utilizing the guide device and fixing device disclosed.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

0017 A guide device according to the present invention is explained in detail below with reference to exemplary embodiments illustrated in the drawings.

0018 Referring generally to Figures 1-4, and in particular to Figure 1, there is shown a device 1 for fixing a component, in particular a headrest (not shown) and in particular in or on a vehicle (not shown). The device 1, which is also referred to below as the guide device 1, comprises, by way of example, in particular a basic body 2 and a sleeve type region 3. The sleeve region 3 serves to receive a fixing or retaining bar 4 which serves to fix and fasten the component. In a partial region of its basic body 2, the guide device 1 has a recess 6, which is also referred to below as slot 6, in which a tolerance compensation member 7, which is also referred to below as a fitting piece 7, is situated. The recess 6 has a height d1 for accommodating the tolerance compensation means or member 7.

0019 Figure 4 illustrates a use scenario or a use situation of the device 1 as part of a vehicle seat. A headrest 10 as an example of a component 10 is situated on a backrest 11 of a seat (not fully illustrated) for use in a vehicle. The headrest 10 is connected to the backrest 11 of the seat by means of a pair of retaining bars 4. The headrest 10 is fastened in that it is connected to the backrest 11 in a manner such that it can be displaced or adjusted in height in the direction of the double arrow denoted by the reference number 12. In the use example illustrated in Figure 4, the device 1 is

connected fixedly to the backrest 11 of the seat, and the retaining bars 4 are connected fixedly to the headrest 10, so that a height adjustment of the headrest 10 relative to the backrest 11 takes place by means of a displacement of the retaining bars 4 together with the headrest 10. Of course, it can conversely also be provided (not illustrated) that the device 1 is integrated in the headrest and that the retaining bars 4 are connected fixedly to the backrest 11, so that, with the retaining bars 4 fixed, a height-adjustability of the headrest 10 is realized by the device 1 being moved along the retaining bars 4 together with the height-adjustable headrest 10.

0020 The device 1, in its sleeve-like region 3, preferably at that end of the sleeve-like region 3 which is opposite the recess 6, has at least one, but preferably a plurality of projections 5 by means of which the arrangement of the device 1 relative to the retaining bar 4 is defined. In particular, the projections 5 are distributed around the outer contour of the retaining bar 4. The projections 5 serve to arrange the retaining bar 4 relative to the device 1 in a defined manner.

0021 The tolerance compensation members (or means) 7, which is arranged in the recess 6 or the slot 6, is illustrated in a perspective illustration in Figure 2. The fitting piece 7 or the tolerance compensation member 7 is provided with a central recess 8 and a plurality of inwardly projecting further projections 9. The further projections 9 bear against the retaining bar 4, in particular in a manner similar to the projections 5. By this means, at the two opposite ends of the device 1, a fixing of the device 1 in relation to the retaining bar 4 or conversely a fixing of the retaining bar 4 in relation to the device 1 is realized, this fixing, firstly, being stable or providing a stable support and, secondly, being easy to move in relation to a first direction, which is denoted in Figure 1 by an arrow and the reference number A and which corresponds to the longitudinal extent of the retaining bars 4 (i.e., runs parallel thereto). Both the projections 5 and the further projections 9 are preferably manufactured from a material with a low coefficient of friction, for example polyoxymethylene (POM) or polyamide (PA), in order to bring about a particularly great ease with which the retaining bars 4 are displaced in the first direction A.

0022 However, in practice, it is the case that there are dimensional tolerances or arrangement tolerances of the retaining bars 4, in particular if a single headrest 10 has

two retaining bars 4 running essentially parallel to each other. In such a case, for example, the two retaining bars 4 do not run completely parallel to each other. In the case of a completely rigid arrangement of the fastening points of the retaining bars 4 in the device 1, i.e. with a fixed arrangement of the projections 5 or of the further projections 9 in the arrangement 1, the dimensional tolerance would therefore result in stresses leading to an increase in the resistance to a displacement of the retaining bars 4 in the first direction A. According to the invention, it is now possible, in a surprisingly simple manner with the tolerance compensation member 7, which is displaceable in relation to the device 1, to ensure both an easy and simple displaceability of the retaining bars 4 and also a stable fixing of the component 10. For this purpose, the tolerance compensation member 7 is arranged displaceably in the recess 6 in at least a second direction B (cf. Figure 1) essentially perpendicular to the first direction A, with the arrangement of the tolerance compensation member 7 in the device 1 being provided in such a manner that a displacement in the second direction B is countered by a resistance which is preferably composed of a frictional force or comprises such a force. This frictional force can be realized with particularly simple means by the fact that the recess 6 or the slot 6 has a lower height d1 than corresponds to the height d2 of the tolerance compensation member 7 (cf. Figure 2). To install the tolerance compensation member 7 in the basic body 2 of the device 1, it is therefore necessary, according to the invention, for the tolerance compensation member 7 to be pressed into the device 1 and to be held there under prestress (in the first direction A). Owing to the relatively small construction space in the slot 6, a compressive force is therefore exerted on the tolerance compensation member 7 in the first direction A, which leads in particular to an elastic deformation of the tolerance compensation member 7. By means of the compressive force exerted on the tolerance compensation member 7 by the device 1 or its basic body 2, a frictional force is realized which opposes a displacement of the tolerance compensation member 7 in the slot 6. According to the invention, such a displacement is possible because the recess 6 for the tolerance compensation member 7, as is clear from Figure 3, permits a greater width b1 than the width b2 of the tolerance compensation member 7. The tolerance compensation member 7 or the fitting piece 7 can therefore be displaced in

the device 1 or in the basic body 2 of the device 1 by the difference between the clear width b1 of the slot 6 and the extension b2 of the fitting piece 7 in the second direction B. According to the invention, the same can be provided in a third direction C (cf. Figure 3) perpendicular both to the first direction A and to the second direction B, i.e. there is mobility of the tolerance compensation member 7 in both directions B and C which are perpendicular to the first direction A. However, according to the invention, it can alternatively be provided that the mobility of the tolerance compensation member 7 is provided exclusively in the second direction B and is not provided in the third direction C. In this case, it is then also possible for the compressive force causing the frictional force to be exerted not in the first direction A but rather in the third direction C on the tolerance compensation member 7.

0023 In Figure 3, as already indicated, a cross-sectional illustration through the tolerance compensation member 7 along a projection direction parallel to the first direction A is illustrated, with it being possible to see the tolerance compensation member 7, its further projections 9, the retaining bar 4 and the basic body 2 or the sleeve-like region 3. Figure 3 also reveals the clear width b1 of the slot 6 and the extension b2 of the tolerance compensation member 7 in the second direction B, so that it is definite that the tolerance compensation member 7 can be displaced in the second direction B by the amount of the difference between b1 and b2. By this means, tolerances which the retaining bars 4 have in their arrangement can be compensated for by the fact that, by means of such a continuous exertion of force of the retaining bars 4 on the fitting piece 7, a displacement of the fitting piece 7 in relation to the device 1 is brought about counter to the frictional force (not illustrated). Following such a displacement, an easy displaceability of the retaining bars 4 in the first direction in relation to the device 1 is then in turn possible. By contrast, however, it is the case that, when accidental movements or forces of the retaining bar 4 occur on the tolerance compensation member 7, a rattling or vibration of the components 10 is opposed by the existence of the frictional forces between the device 1 and the tolerance compensation member 7. The fitting piece 7 can therefore be displaced relative to the basic body 2 in the plane perpendicular to the first direction A, but with a rattling of the fitting piece 7 in the slot 6 being prevented by the prestress.

0024 According to the invention, the sleeve-like region 3 of the device 1 is provided in such a manner that the projections 5 preferably bear resiliently against the retaining bar 4. By means of the possibility of displacing the tolerance compensation means 4, a displacement of the headrest 10 on the retaining bar 4 or a displacement of the retaining bars 4, with the latter not being aligned completely parallel to each other, leads to a displacement of the fitting piece 7 in the slot 6, with the result that the incomplete parallelism of the retaining bars 4 is compensated for and a jamming of the basic body 2 or of the device 1 on the retaining bars 4 is avoided.